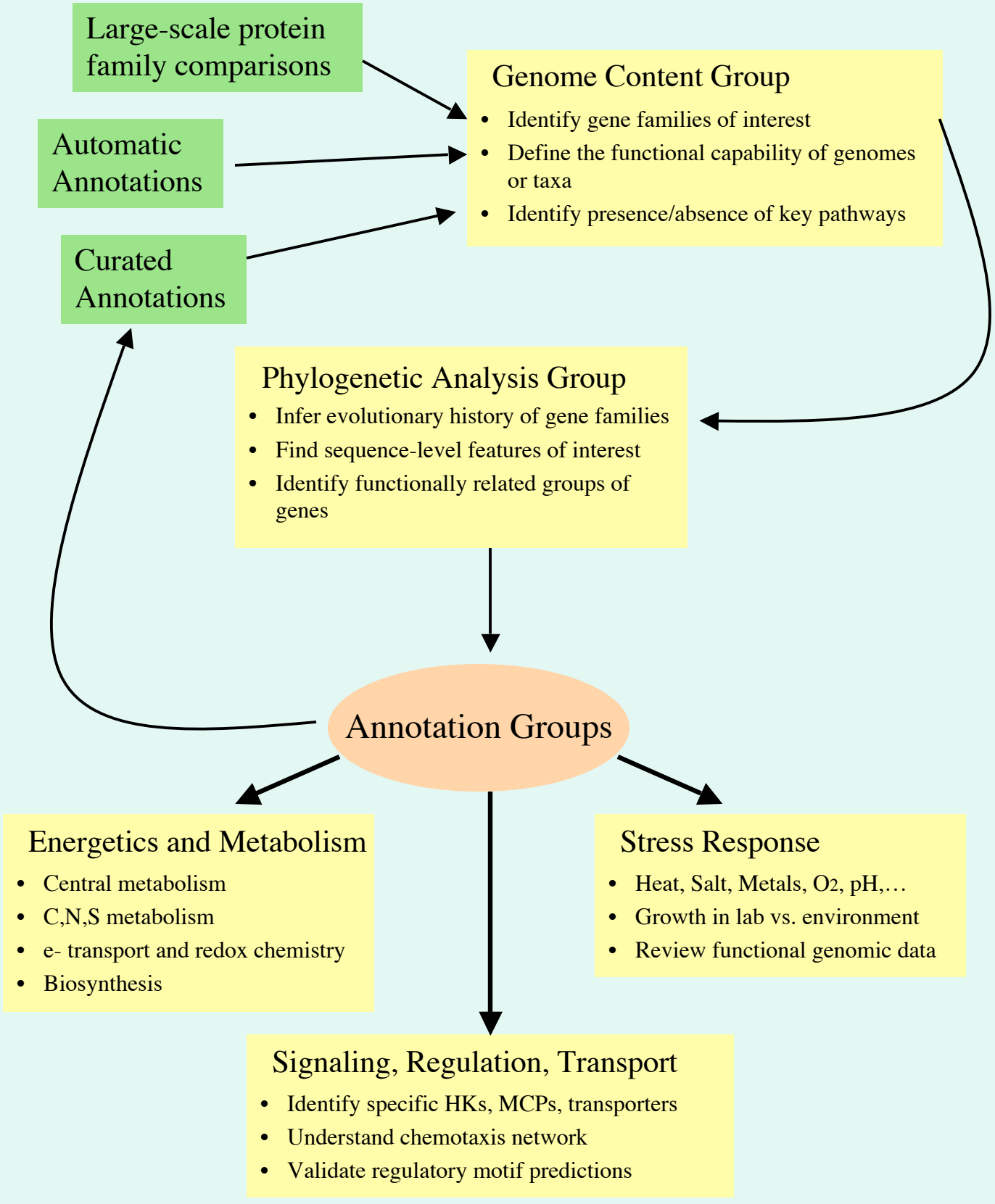
JGI/VIMSS Jamboree Workflow



Genome Content Group

Team members: Adam Arkin (Lead), Morgan Price

Primary Objectives:

- Identify presence/absence of pathways genomes of interest
- Identify unusual gene family expansions for further analysis by Phylogenetic Analysis group
- Outline of physiological capability of target organisms
- Enumerate specific differences between Hildenborough and G20 strains in terms of gene content of the same pathways
- Define the "genomic equivalent" of a sulfate reducer

Specific Goals:

- Address proposed comparative genomics research questions

Phylogenetic Analysis Group

Team members: Eric Alm (Lead), Toby Richardson, Nikos Kyrpides, Paramvir Dehal, Pilar Francisco

Primary Objectives:

- Support annotation groups with phylogenetic analysis of gene families identified by Genome Content Group to establish orthology/paralogy relationships
- Identify and characterize unusual sequence-level features for proteins of interest to Annotation Groups
- Identify functional associations between genes to assist in characterization by Annotation Group

Specific Goals:

- Detailed evolutionary history for HK, MCP, cytochrome families
- Address evolutionary questions in proposed research directions

Annotation Groups

Team members:

- **Energetics and Metabolism** - Gerrit Voordouw and Larry Barton (Group Leaders), Sergey Stolyar, Natalia Ivanova
- **Signaling, Regulation, Transport** - Ralf Rabus (Lead), Chris Rao
- **Stress Response** - Judy Wall (Lead), Matthew Fields, Masood Hadi, Katherine Huang

Primary Objectives:

- Curated annotations of key pathways
- Reconstruction of cellular networks
- Produce network diagrams to assist model building
- Characterize specific differences in network structure between Hildenburough and G20 strains, and analyze implications for phenotype
- Summarize previously characterized and newly predicted physiological capabilities of target organisms, and work with Genome Content Group to identify specific genes responsible for differences among species

Specific Goals:

- Energetics and Metabolism
  - Network diagram for e- transport, role of different e- donors/acceptors
  - Metabolic network for central metabolism including C,N,S metabolism
  - Address relevant proposed research questions
- Signaling, Regulation, Transport
  - Catalog signals cells can likely detect
  - Identify substrates for transporters
  - Review predicted cis-regulatory motifs
  - Produce model of chemotaxis network
  - Address relevant proposed research questions
- Stress Response
  - Generate network diagram for various stress responses (O2, salt, osmolar, pH, UV, DNA repair, metal, heat, cold)
  - Interpret functional genomics data
  - Address relevant proposed research questions

Jamboree Agenda

- **Sunday, April 18**
  - 5:30pm-7:30pm Social Hour in the Embassy Suites Center Atrium (complimentary beverages and snacks provided)

- **Monday, April 19**
  - 8:30am-9 Breakfast
  - 9-9:30 Adam Arkin, Welcome / Introduction to GTL: Genome Sequence to Modeling
  - 9:30-10 Eric Alm, Overview of the Jamboree and Research Directions
  - 10-10:30 Alla Lapidus, Microbial Genomics at JGI
  - 10:30-11 Break
  - 11-11:30 Larry Barton, Energetics in SRB
  - 11:30-12 Sergey Stolyar, Central Metabolism of the SRB
  - 12-1 Lunch
  - 1-1:30 Paramvir Dehal, Phylogenetic Analysis of Histidine Kinases in the Deltaproteobacteria
  - 1:30-2 Shelley Haveman, Energy metabolism of the sulfate-reducing bacterium Desulfovibrio vulgaris Hildenborough
  - 2-2:30 Chris Rao, Reconstructing the Chemotaxis Network of D. desulfuricans G20
  - 2:30-3 Break
  - 3-3:30 Morgan Price, Preliminary Comparative Genomic Analysis of Desulfovibrio Genomes
  - 3:30-4:30 Katherine Huang, Using the VIMSS Tools for Genome Analysis and Annotation/Description of VIMSS Automatic Annotations
  - 4:30-6pm Annotation begins

- **Tuesday, April 20**
  - 8:30am-9 Breakfast
  - 9-9:30 Judy Wall, TBA
  - 9:30-10 Dmitry Rodionov, TBA
  - 10-12 Annotation
  - 12-1 Lunch
  - 1-4 Annotation
  - 4-5 Reports from group leaders/Open discussion
  - 5-6pm Annotation

Jamboree Agenda

- **Wednesday, April 21**
  - 8:30am-9 Breakfast
  - 9-9:30 Jessica Butler, Genome Annotation of Geobacter species
  - 9:30-10 Ralf Rabus, Genome Annotation of Desulfotalea aromatica
  - 10-12 Annotation
  - 12-1 Lunch
  - 1-4 Annotation
  - 4-5 Reports from group leaders/Open discussion
  - 5-6pm Annotation

- **Thursday, April 22**
  - 8:30am-9 Breakfast
  - 9-9:30 Qingwei Luo, Genes Necessary for Survival Under Natural Environments
  - 9:30-10 Rajesh Sani, Toxicity of metals to D. desulfuricans G20
  - 10-10:30 Inna Dubchak, The JGI Community Sequencing Program
  - 10:30-12 Annotation
  - 12-1 Lunch
  - 1-4 Annotation
  - 4-5 Reports from group leaders/Open discussion
  - 6:30pm No-host dinner

- **Friday, April 23**
  - 8:30am-9 Breakfast
  - 9-10:30 Annotation
  - 10:30-12pm Discussion of key findings/plans for future work